

Active Learning, Active Living: An Insight under Pandemic

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Abstract—Learning in Technical Education relies greatly on experiences from experiments. Recent pandemic condition has jeopardized such learning. To know the impact of COVID 19 or any others on it, we need to work at the root and not on the symptoms only. Activities during this time by mankind exhibit a clear notion of fear about the future life. During this kind of transient, generally our vision on the moment becomes blur. This has further engrossed the stake-holders of technical education for not being an expert in Biology. In this address, we will find the factor that restrains our learning and reveal a deeper meaning of Teaching-Learning process.

Index Terms—Teaching-Learning Process, Pandemic, Root-Cause Analysis

I. INTRODUCTION

Teaching-Learning Process (TLP) is crucial for sustenance of mankind and the nature. The very process requires both objective and subjective approaches. In ancient India, this process used to begin with the following chanting.

ॐ सह नावतु
सह नौ भुनक्तु
सह वीर्यं करवावहै ।
तेजस्वि नावधीतमस्तु
मा विद्मिषावहै ।

Meaning: May we all be protected, May we all be nourished, May we work together with great energy, May our intellect be sharpened, Let there be no animosity among us. [1]

The practice was not to chant it mechanically by pupils following the teacher's voice but to actively participate with its deeper meaning. The similar ethos was extended in every sphere of learning during the period. The great seers in this period (Vedic and Vedantic) realized that our perception of the reality constrained by our sensory organs and the knowledge about the world is limited. Therefore, a continuous search for understanding the nature is observed through self-realization. The goal becomes

difficult as humans have higher degree of freedom due to limited nature of the perception. This freedom beyond the physical world—defined by five senses—has generated a perpetual conflict in each individual as well as in whole mankind. The mantra (patterns of sounds) is to make aware all about this conflict and to remain free from the state of ignorance. However, in today's human society this awareness is lost and the conflict prevails with greater magnitude which is also reflected in the current pandemic situation.

Evidently, one may raise question if we are going in right direction. This very question will generate conflict among us as we may identify any path—chosen from the dimensions beyond the senses—as right or wrong. To come out of this problem, we may delve into the basic operating mechanism of a cell membrane. It is a permeable barrier that select something to pass into the cell and stop others for the cell's sustenance. We can find analogy of this with filters—building block of intelligence. The same mechanism appears in brain as the capacity to distinguish between necessary and unnecessary components of physical and psychological spaces. While the basic needs are physical in nature, extension of it in psychological space creates clutter in learning and jeopardize the sustenance of mankind [2]. In this address we want to see the underlying structure of current situation and find the root-cause instead of walking on the surface.

II. LIFE AS NETWORK: A DYNAMICAL SYSTEM

The fundamental principle of life in this world is that every form of it is directly or indirectly related to each other. Thus, we can represent the existence of life as a network—just like the network of systems (shown in the Fig. 1). We may easily then see the human world as a sub-graph. This sub-graph divides further into different sects with physiological and psychological differences. Human in individual or collective sense form nodes in this large network. Through the relation—established by action & reaction between nodes—the state of each node changes. Essentially, movements of states of nodes make the whole graph and thereby the life a dynamical systems. This is clearly observed through the experience of mankind since the commencement of our life. Sustenance of human or the

any life form completely depends on if we move from one stable state to another.

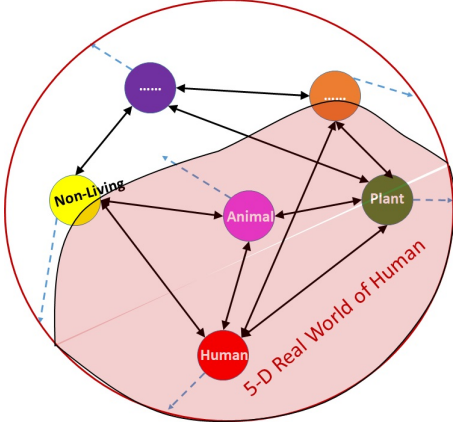


Fig. 1: Natural Relational Network

One pertinent question here is what moves the states or what is the nature of stimulus? When we study a filter (analogous to human as node in the network) subjected to a signal (stimulus) the signal is modified and the remaining energy (noise) is dissipated through the filter components. Here, generally filter parameters remains constant or even if perturbed returns to its stable state quickly. Although, man made systems can be treated objectively, natural systems requires a subjective approach due to the existence of psychological space of individual or collection. We need to understand this noise that appears in the mental level and can lead to instability. To find it, let us now turn to our psychological space (Fig. 2).

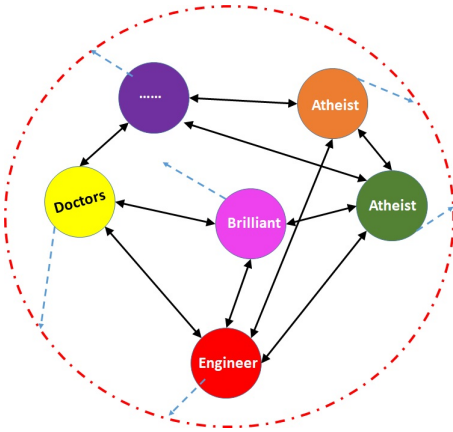


Fig. 2: Psychological Space/Network

III. THOUGHT AS SYSTEM: THE CONCEPT OF TIME

We can easily see the brain as a processor which acts on the arrival of stimulus through sensory organs or evoked memory elements or combination of both (Fig. 3). A minute observation will reveal the thought as a recursive system. So, a seed thought can evolved into cascades of

thought and diverge. To understand the true dynamics, here we need to revisit the concept of time.

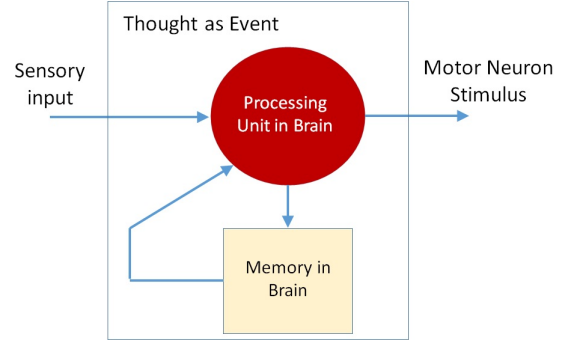


Fig. 3: Thought as Event and Psychological Time/Space

To begin with, we ask what is time? We all the use of time but are we aware that time is a scale to identify change of events! To specify our activities in sequence we refer time of the clock which is synchronized with Earth's rotations. At physical layer this is necessary. So, the chronological time is used to quantify the change of events. Let us now ask ourselves, what are the different events we are linked to? With a minute observation, we can reveal that thought—generated in our brain—is also an event or process. When we begin to think based on sensory input or signals from our memory about past events, we may call it as seed thought. Further observation, explores the movement of thought from this seed even if the stimulus through the senses has been stopped. So, we create a series of change of thoughts—change of events. Thus, we create a sense of time in mind. We can call it as psychological time and it is free from the chronological time.

Now, we live with two time scales: Chronological & Psychological. We feel stress, fear, uncertainty, insecurity etc. when this two scale does not match. Our individual as well as collective experience shows such mismatch occurs very frequently particularly when we live with conflict or confusion inside. This may lead to divergence in the expressions through motor neuron activities leading to instability in us [3]. To obviate the problem, we need such insight and end the thought a at the seed level which is moved by memory—the past or knowledge—as shown in Fig. 4.

IV. MEASUREMENT: ABSTRACT OR REAL

Thought creates psychological space. When this is synchronized with current moment or network of existence, we can live with clarity; Our understanding about present situation will be free of clutter. So, we need to observe the movement of thought every moment without input from the memory. Memory stores past or reference, and a continuous process of comparing ourselves goes on for evaluation of performance. We want to be the reference and

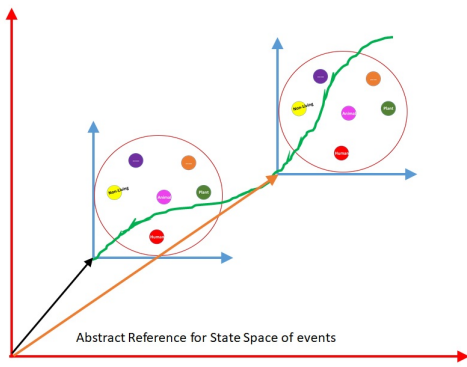


Fig. 4: Abstract State-Space Representation of Existence

thereby create a conflict between our current self-image and image of the reference. Thus, we diminish our ability to find the true potential because of such division. This can be observed in learning process where competition with others are encouraged. However, such competition may equally lead to improvement or deterioration of the skill of a learner in the domain of concern.

Very often when we go for developing a policy for education or any other purpose we measure several parameters through survey/experiments. Considering the process as random, we find a probability density function of the parameters. Essentially, this is information. This discloses about the process related to the parameters. Commonly, such distribution takes a shape of normal /Gaussian curve. We find the expected value and variance and make a policy that favours the population around the expected value as majority of the samples falls within it as shown in Fig. 5. But such a policy always enslaves the valid but minority samples that lies beyond this zone. This becomes prominent when we see data decoupled from its process of generation and develop a measurement /computation methods with a presumed result to favour a particular group(s).

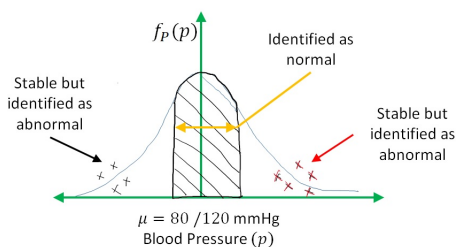


Fig. 5: Implication of Passive Learning: Measuring Blood Pressure from Data decoupled from Physiological Significance

Let us observe the efficacy of such method in teaching-learning process. We quantize the ability of students using marks or grades which may reflect the skill of him/her

in examination. Majority of the cases this relates to the ability of a student to reproduce the results taught in class as a “look-up Table” way. They know examples of problems and their solution the way a teacher had taught them. So, when a new problem with no prior knowledge of result arrives, they remain clueless and in confusion mostly. They try to find entries from the look-up table—the knowledge. Thus, the parameter mark or grade only reflect a skill that is mechanical in nature. For sustenance of learner we need more dimensions to add which is subjective in nature. This requires free of past knowledge, free of comparison, free of fear of uncertainty and love towards any work/study at hand.

V. CONCLUSION

Onset of Covid-19 pandemic and subsequent activities are showing clearly that we are in confusion, full of clutter about the new condition and the sustenance. Therefore any solutions—governing policies—based on the symptoms are of partial help [4]. Even with the digital technology, internet, abundance of information, fear prevails. The same has also been crept in education system. We are concern about the future of technical education at the surface level. We are making policies without being aware of the movement of our thought at individual and collective levels. At the physical level, we need a customized solution instead of rejecting outliers in Gaussian Curve. We can see that while measuring performance of a machine is essential, practice of comparing one another is detrimental as the constitution of any two persons are not same in both psychological and physiological levels. Therefore, impact of emergency situation is different for each one of us. If we observe minutely on the learning path of individual, we see a variation among us. However, everyone learns significantly in any domain when he/she love to do so. In that process, no one, no condition can stop learning. But when we remain in confusion, conflict by comparing each other, we simply put learning on hold. During that period if we observe the movement of thought and end all that are unnecessary, we can live our life actively and collectively. Such active learning will help us to sustain. At this point we may also think of possibilities of natural or man-made pandemic. If the pandemic is a natural calamity then it may fade away and we can live as earlier. To prevent the later condition, every individual need to be aware of the movement of thoughts every moment and remove all the conflicts created by unnecessary thought.

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